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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/528,137

12/12/2005

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EXAMINER

MACARTHUR, SYLVIA

ART UNIT

PAPER NUMBER

1792

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/528,137	Applicant(s) OZAKI ET AL.	
	Examiner Sylvia R. MacArthur	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 9-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 3/17/2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Arguments

1. Applicant's arguments with respect to claims 1-8 and 18 have been considered but are moot in view of the new ground(s) of rejection. Applicant's amendment of claims 1 and 18 that the entire surface of the seal cap (20) be covered by the cover (42) necessitated the introduction of Fujita et al (US 6,238,488).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-8 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kogano et al (US 2002/0094502) in view of Fujita et al (US 6,238,488).

Kogano et al teaches a heat treatment boat.

Regarding claim 1: A substrate processing apparatus comprising: a reaction furnace A for processing a substrate; a seal cap 17 for sealing the reaction furnace hermetically (see discussion of o-ring 11) ; a cover 19 installed separately from the seal cap so as to cover at least a section of the surface of the seal cap facing the inner side of the reaction furnace; a small chamber formed at least by the seal cap and the cover; a feed opening for supplying a first gas 4A and a feed opening for supplying a second gas 10 into the reaction furnace, see Figs.1, and 3-6 , and see for example the abstract and pages 2-7 . Note that the entire surface of the seal cap is covered by the cover.

Kogano et al fails to teach that both the feed gases are supplied to the reaction furnace.

The prior art of Fujita et al teaches a seal cap 28 and a cover 22 that form a small chamber as illustrated in Fig.1. Feed lined 36 and 38 correspond to the feed openings wherein 38 comprises the recited flow outlet. The prior art of Kogano provides evidence that a furnace reactor that supplies a plurality of gas an additional gas into the reaction furnace is conventional and often used when the treatment gas comprises a mixture of gases. Thus, it would have been obvious at the time of the claimed invention to use the teachings of Fujita et al in the apparatus of Kogano et al to provide a means to supply a plurality of gases.

Regarding claim 2: The substrate processing apparatus according to claim 1, wherein the small chamber is formed by the seal cap and the cover and the inner wall surface of the reaction furnace; and the flow outlet is formed by a clearance between the cover and the inner wall surface of the reaction furnace see Figures.

Regarding claim 3: The substrate processing apparatus according to claim 2, wherein the reaction furnace includes a process tube, and a furnace opening flange for supporting the process tube; and the small chamber is formed by the seal cap and the cover and the inner wall surface of the furnace opening flange; and the flow outlet is formed by a clearance between the inner wall surface of the furnace opening flange and the cover, see Figures.

Regarding claim 4: The substrate processing apparatus according to claim 3, wherein the furnace opening flange includes an inlet flange for supporting the process tube, and a base flange for supporting the inlet flange; and the small chamber is formed by the inner wall surface of the base

flange and the cover and the seal cap; and the flow outlet is formed by a clearance between the inner wall surface of the base flange and the cover, see Figures.

Regarding claim 5: The substrate processing apparatus according to claim 4, wherein the feed opening for supplying the first gas is provided in the base flange; and the feed opening for supplying the second gas is provided in the inlet flange, see Figs. 1 and 7.

Regarding claim 6: The substrate processing apparatus according to claim 1, wherein the cover is formed by a plate-shaped member, see Figures.

Regarding claim 7: The substrate processing apparatus according to claim 1, comprising a boat 19 for holding multiple substrates approximately horizontally at intervals in multiple stages, and a rotation mechanism for supporting and rotating the boat by way of a rotating shaft 18 penetrating through the seal cap, wherein the cover is installed in the rotating shaft, see [0029].

Regarding claim 8: The substrate processing apparatus according to claim 1, wherein the first gas is ammonia, the second gas is dichlorosilane, and a silicon nitride film is formed on the substrate by the thermal CVD method in the processing, the invention is held to an apparatus, the supplies of Sato et al are inherently capable of supplying the gases listed in the claim as what specific gas is supplied does not structurally limit the prior art of Kogano et al.

Regarding claim 18: A semiconductor device manufacturing method comprising the steps of: loading a substrate into a reaction furnace; sealing the reaction furnace hermetically with a seal cap; processing the substrate by supplying a first gas into a small chamber formed by the seal cap and a cover installed separately from the seal cap so as to cover at least a section of the surface of

the seal cap facing the inner side of the reaction furnace, along with making the first gas flow into the reaction furnace from a flow outlet provided in the small chamber, and supplying a second gas into the reaction furnace from a second feed opening provided further downstream than the flow outlet; and unloading the substrate from the reaction furnace, see Figures and entirety of Kogano et al. Also see the rejection of claim 1.

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R. MacArthur whose telephone number is 571-272-1438. The examiner can normally be reached on M-Th during the hours of 8 a.m. and 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

September 29, 2008

/Sylvia R MacArthur/
Primary Examiner, Art Unit 1792